

Title: Biomedical Imaging Registration – Trends and Applications

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Abstract

Data registration, i.e., the process of transforming a dataset so that the entities represented are properly adjusted to the homologous entities represented in a second dataset, has been a topic of huge research in various scientific fields. In Computational Vision, such transformation is commonly used on static images, but also on image sequences, and is usually known as image registration. For example, in medicine, computational methods of image registration have been assuming an essential role in supporting enhanced diagnosis, the fusion of information conveyed in images acquired by different techniques, the follow-up of organs and pathologies, in computer-assisted surgery, etc. Thus, the computational registration of images has been a remarkable tool for clinicians and researchers since, after the truthful registration of the data involved, tasks such as image analysis, comparison of a given clinical case with previously studied ones, the automatic identification of regions of interest and information fusion, are facilitated and can be performed automatically and without subjectivity. During this presentation, the topic of image registration is going to be introduced, automatic computational methodologies to register images and image sequences are going to be described, and application cases involving static images, image sequences and images acquired by different techniques are going to be presented and discussed.

Biography

Dr Tavares graduated in Mechanical Engineering from the University of Porto (Portugal) in 1992, and got the MSc and PhD degrees in Electrical and Computer Engineering from the same University in 1995 and 2001, respectively. Since 2001, he has been senior researcher and project coordinator at the Lab. of Optical and Experimental Mechanics at the Institute of Mechanical Engineering and Industrial Management, and Assistant Professor at the Department of Mechanical Engineering of the Faculty of Engineering of the University of Porto.

He is co-author of more than 350 scientific papers in national and international journals and conferences and co-editor of 17 books and guest-editor of several special journal issues. In addition, he is Co-Editor-in-Chief of the International Journal for Computational Vision and Biomechanics and of the International Journal of Imaging and Robotics; Editor-in-Chief of the International Journal of Biometrics and Bioinformatics; Associate Editor of the ISRN Machine Vision and of the Journal of Computer Science, and reviewer of several journals. Dr Tavares has been Supervisor and Co-Supervisor of several MSc and PhD Thesis, involved in several research projects, both as researcher and as scientific coordinator, and he is co-author of 3 international patents. In addition, he has been Co-Chairman of various international conferences, such as: CompIMAGE 2006/2010/2012, VipIMAGE 2007/2009/2011, CIBEM 2011, BioDENTAL 2009/2012, TMSi 2010, IMAGAPP 2009 and EUROMEDIA 2008; and of numerous mini-symposia, workshops and thematic sessions; and member of scientific and organizing committees of several national and international conferences.

His main research areas include Computational and Computer Vision, Biomechanics, Scientific Visualization, Human-Computer Interaction and New Product Development.

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